



Entrainment of the circadian clock



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Project Info: EUCLOCK - Entrainment of the Circadian Clock

 is an Integrated Project (Sixth Framework Programme) funded by the [European Commission](#) 

Acronym: EUCLOCK
Contract Number: LSHM-CT-2006-018741
Starting date: 01.01.2006
Duration: 5 years
Budget: 16,036,195 €
EU-contribution: 12,299,389 €
Scientific Officer: Jacques Remacle Ph.D.

EUCLOCK is a large European wide research network that has been launched in January 2006. This project aims at the investigation of the circadian clocks in single cells and in humans. Behaviour, physiology, and biochemistry are temporally structured and characterised by daily oscillations. These cycles are not simply driven by external changes as light/dark or warm/cold. They are controlled by endogenous clocks that are prevalent in the most diverse organisms, from cyanobacteria to humans. These circadian clocks are synchronised to the outside world by a process called entrainment, which is generated by rhythmic environmental signals, called 'ZEITGEBERS'. EUCLOCK researchers are precisely interested in how these circadian clocks are synchronised to their specific cyclic environment. Therefore, EUCLOCK combines the expertise of 34 chronobiologists from 29 institutions in 11 European countries. EUCLOCK's budget is more than 16 million EUR over 5-years, of which 12 millions are a contribution by the European Union.

EUCLOCK researchers utilise the most advanced methods of functional genomics and phenomics in order to compare genetic model organisms and humans. For example, the prerequisites for large-scale, non-invasive research on human entrainment in the field will be developed. The first animal models for shift-work will be created. In analogy to 20% of Shift Workers in the population, flies and mice will be exposed to 'shift work' schedules. They will be active and fed out of phase with their natural rhythms. The ensuing "dys-entrainment" will be investigated at levels from genes to behavior. This work aims at providing insights for the prevention of the negative consequences of human shift-work.

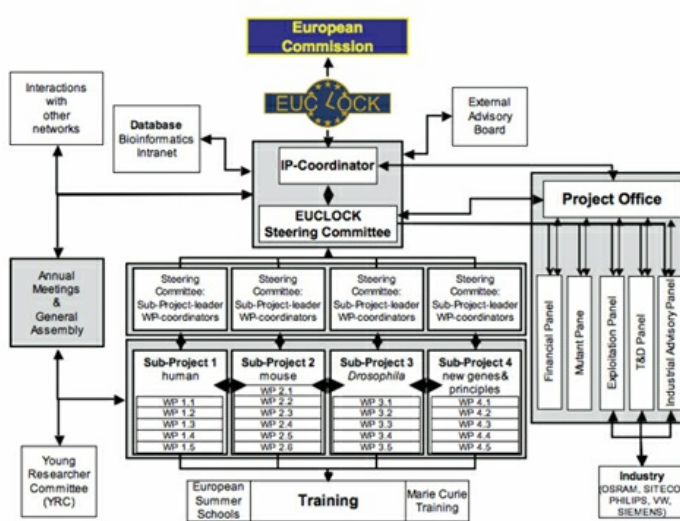
Furthermore, new genetic components that control the circadian clock and its entrainment will be identified in animals and in humans. New tools will be developed and new circadian model organisms will be explored. These will enable the field of chronobiology to exploit the advantages of systems biology research on circadian timing to be performed and integrated at the level of the genome, the proteome, and the metabolome. The innovations of EUCLOCK are predestined to shape the future of circadian research.

EUCLOCK is divided into four Sub-Projects that each manage specific Research activities and implement EUCLOCK's objectives:

- [SP 1: Humans](#) (Anna Wirz-Justice, University of Basel)
- [SP 2: Mice](#) (Urs Albrecht, University of Fribourg)
- [SP 3: Flies](#) (Charlotte Helfrich-Förster, University of Regensburg)
- [SP 4: Novel clock genes and principles](#) (Martha Merrow, University of Groningen)

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In parallel [EUCLIS](#) (EUCLOCK Information System) is established to support the infrastructure between EUCLOCK researchers and the worldwide Chronobiology community. EUCLIS is an advanced database architecture, which will integrate experimental data, computational models and external information. (Eduardo Mendoza, LMU Munich & University of the Philippines Diliman)

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